

XIX. *On a new Genus of Plants of the Family of Burmanniaceæ.*

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THE curious little rhizomatous plant that forms the subject of the present notice is a native of Brazil, and is the more deserving of attention on account of its close relation to another not less singular plant lately found in a very opposite quarter of the world: but before offering any remarks on its affinities, I will present an outline of its generic features. The name by which I propose to distinguish it is *Ophiómeris*, from ὄφις, *serpens*, μερῖς, *membrum*, on account of the serpentine shape of the interior segments of its perianthium, which assume very much the same form as those of the remarkable genus *Triuris*, the details of which have been honoured with a place in the Society's Transactions\*.

## OPHIÓMERIS.

CHAR. DIFF. *Perianthium* superum, tubulosum, gibbosum, caducum; fauce laterali annulo semiclausâ; limbo 6-partito, laciniis 3 exterioribus brevibus ovatis, 3 interioribus longissimis subulatis. *Stamina* 6, libera, infra perianthii faucem inserta et ejus laciniis opposita, inclusa, versus tubum retroflexa; filamentis petaloideis expansis, margine appendiculatis; antheris adnatis, in sinu filamentorum terminalibus, 2-ocularibus, loculis longitudinaliter dehiscentibus. *Ovarium* inferum, 1-loculare; placentis 3 parietalibus, medio ovuligeris, ovulis indefinitis anatropis. *Stylus* brevis. *Stigmata* 3. *Fructus* turbinatus, truncatus, apice operculatim dehiscens, 1-locularis. *Semina* plurima scobiformia. *Embryo* ignotus.

CHAR. NAT. *Perianthium* monophyllum, petaloideum, tubulosum, imo ovario adnatum, demùm circumscissum et deciduum, tubo lineis 6 notato, ventricoso, valdè gibboso, fauce ferè laterali valdè contractâ, coronâ depressâ annulari, margine integro colorato; limbi laciniis 6, in duplici serie, inæqualibus; 3 exterioribus (sepalis) obovatis, obtusis, reflexopatientibus, æstivatione subimbricatis; 3 alternis (petalis) angustioribus tereti-subulatis,

\* Trans. Linn. Soc. xix. p. 77.

longissimis, tubum æquantibus, æstivatione spiraliter inclusis. *Stamina* 6, æqualia, inclusa, libera, laciniis opposita, infra coronam orta; filamenta omninò retroversa et juxta tubi parietem deflexa, in laminas subpetaloideas complanata, citò contracta, demùm dilatata, apice profundè emarginata, lobulis 2 sejunctis terminata, margine utrinque lacinulâ linearis subulatâ sigmoideâ suberectâ notata; antheræ parvæ, ovatæ, 2-loculares, loculis collateralibus, subdivergentibus, dorso adnatis, longitudinaliter dehiscentibus, ad apicem infra sinum emarginaturæ positæ, perianthium spectantes, et tunc ob filamentum inflectionem pseudo-extrorsæ, sed reverà introrsæ. *Ovarium* suburceolatum, perianthio adnatum, apice liberum, subconicum, 1-loculare, multiovulatum; placentis 3 parietalibus. *Stylus* subbrevis, rectus. *Stigmata* 3, erecta, inclusa. *Pericarpium* carnosum, turbinatum, 6-sulcatum, perianthii imâ basi circumscissâ marcescente marginatum, discoque apicali (stylo) demum operculatim deciduo terminatum, orâ circulari apice apertum, 1-loculare, polyspermum. *Semina* minuta, oblonga, fusiformia, subcompressa, scobiformia, in placentis tribus parietalibus aggregata, erecta, et quoad funiculum deflexum retroversa; testa laxa nucleo paullò amplior, libera, diaphana, areolis longissimis angustatis reticulata, costis parallelis valdè prominulis, funiculo reticulato, tenui, ejusdem longitudinis; endopleura tenuissima, areolis magnis, paucis, subangulatis cancellata; nucleus? (albumen?) grumosus, homogeneus?; embryonis forma ignota.

Plantæ Brasilienses, *hyalinæ, super lignum cariosum parasiticæ, rhizomate tuberoso, fibrillis numerosis*; caule *simplici, erecto, subflexuoso, angulato, ferè aphyllò*; flore *solitario, terminali, basi 2-4-bracteato*, bracteolis *brevibus, vel sub flore, vel in medio caule, erectis*; perianthii tubo *subhyalino*, petalis *roseis*, sepalis *flavis*, coronâ *luteâ margine aurantiacâ*; fructu *hyalino*.

1. *Ophiomeris Macahensis*, caule nudo, bracteolis 2-3nis florem solitarium terminalem suffulcentibus, perianthio hyalino; sepalis rosaceis.

*Hab.* Ad Macahè, Provinciæ Rio de Janeiro.

Planta hyalina, 2-3-pollicaris.

2. *Ophiomeris Iguassuensis*, caule subnudo medio bracteolis 3-4 iis speciei prioris duplò longioribus in verticillum dispositis, flore solitario terminali nudo.

*Hab.* Ad Iguassù, Provinciæ Rio de Janeiro.

Planta hyalina, vix pollicaris.

Both these plants appear to be extremely rare, and were found by my son growing upon the decayed trunks of trees in the deep shady forests, in distant places, near the foot of the Organ Mountain range. Of the latter species I obtained specimens in 1841; but at that time I was unable to comprehend its

nature, as it was only in seed after dehiscence, and it was not until I received last year two specimens of the former species preserved in spirits, together with a drawing of the plant in its living state, that I was enabled to ascertain its true relations. It appears to be seldom more than 2 inches high, with a knotty tuberous root, from which spring numerous fibrillæ, that seem to propagate themselves by stoloniferous offsets. The stem is slender, erect, somewhat flexuose, striated, colourless, and hyaline. The perianth, arising out of 2 or 4 short bracts, is gibbosely globular and pyriform, 4 lines in diameter in its widest part, somewhat fleshy, transparent, and of a delicate rosy hue on the more convex face, white and almost translucent on the opposite more contracted side, and is marked with 6 slender longitudinal lines, corresponding with the segments of the border. The sepals are somewhat triangular, thrown back, of a dull yellow colour at the base, transparent toward the apex, and about a line in length. The petals are slender, subulately terete, 6-7 lines long, slightly curved, irregularly patent, and of a pinkish hue; in æstivation they are spirally coiled together, and concealed within the sepals, whose margins slightly overlap each other: inside of the petals there is a raised edge of a bright chrome yellow, within which the mouth is nearly closed by a flat annular depressed rim, of the same but somewhat duller hue. The stamens derive their origin from beneath the annular rim, and are pendent against the inner wall of the perianth: they are quite free and equal; the filaments are broad at their origin, then somewhat contracted, and soon again widen into a broad petaloid expansion, with a somewhat truncated apex, having a broad emarginature in the centre, between 2 prominent thickened globular lobes, from the sides of which spring as many lateral, subulate, recurved, sigmoid appendages, which lie parallel with the filament, and are somewhat shorter; the anthers are oval, comparatively very small, consisting of 2 parallel cells, bursting longitudinally, laterally connected together at one extremity, slightly divaricated at the other, and fixed by their back near the apex of the filaments below the emarginature, being attached upon the inner face, so that their aspect is always towards the tube of the perianth: they seem therefore to be extrorse, although, if the filaments were not retroflexed, they would in reality appear in the usual introrse position. The ovarium is inferior, somewhat turbinate, and crowned with a thin conical disc; it is 1-celled, with 3

distinct prominent longitudinal parietal lines, that bear in their middle a somewhat 2-lobed placenta, on which a number of ovules are crowded. The style which terminates the conical disc is short, apparently fistulose, striated, expanding towards its apex into a 3-lobed, hollow, cup-shaped stigma, with 3 rather erect triangular fleshy lobes, which are alternate with the placentæ (as in *Dictyostega*); these lobes are covered with a mucous exudation and numerous hair-like papillæ, but after the process of fructification is completed the stigmatic lobes become quite glabrous on their surface. The tube of the perianth now falls away by a clean horizontal circumscissure, a little above the line of its junction with the ovarium: after this, the conical disc of the ovarium detaches itself like an operculum, leaving a fleshy open cup, in which the seeds appear arranged in 3 clusters, upon the parietal lines above-mentioned. The seeds are numerous, minute, and scobiform, erect, each being supported upon a recurved slender funiculus of its own length: the testa is quite transparent and reticulate, the cells being narrow and almost scariiform, often the length of the nucleus; beyond this, at each extremity, they become much smaller: the inner membrane that immediately covers the nucleus is also transparent, but does not fill the entire cavity of the testa; it is marked by a few (6 to 8) somewhat hexagonal arcolæ: the nucleus appears to consist of a homogeneous grumous mass, but I have had no opportunity of determining the precise nature of its structure.

From the above details it will be seen how very closely this plant approaches the genus *Thismia* of the late Mr. Griffith, described in the 19th volume of the Society's 'Transactions,' p. 341; and it affords a singular coincidence, that plants of such curious structure, and so nearly allied, should about the same time have been discovered in the Malayan territory, Ceylon, and Brazil. I have lately had an opportunity of seeing in the herbarium of Sir William Hooker dried specimens both of Mr. Griffith's plant, and of another (probably the same species) found near Galle, in the island of Ceylon, by Captain Champion, from both which the Brazilian plant will be seen to differ in many essential points. In the latter, the remarkable gibbosity of the perianth is quite peculiar; its tube is also smooth, not impressed by 6 deep rounded grooves, and does not present the 12 crimson-coloured longitudinal rows of prominent tubercles with the intervening grooved lines seen even in the

dried state in *Thismia*, although it has 6 almost imperceptible nervures; the corona is circular, not hexagonal: it differs also in the shape and disposition of the filaments, which are quite distinct and unconnected, while in *Thismia*, although at first separate in their origin, they soon become united into a long and completely monadelphous pendulous tube with 12 distinct nervures\*: the anther-cells are here arranged in 6 pairs, near the commencement of the line of tubular junction, each pair consisting of 2 distinct and unconnected lobes, separated by the nerval lines that spring from the corona; alternate with these are 6 other nervures, arising from each sinus formed by the junction of the filaments, and terminating in as many coloured glands, at the points where the tube again becomes cleft into a double line of 6 equal pairs of thin parallel truncated laminae, one overlapping the other, each being fringed at its extremity by 3 or more teeth. In *Ophiomeris*, on the contrary, the filaments are in no way monadelphous, and are considerably narrower at their origin; the anthers are placed, not towards the middle, but close to the apex of the filament, which is remarkable for its 2 obtuse terminating lobes and winged lateral appendages; the 2 cells of the anther, too, are laterally conjoined, not in separate lobes as in the Asiatic genus.

The alliance of *Thismia* to *Burmanniaceæ* did not escape the notice of Mr. Griffith, although on the whole he was somewhat more disposed to compare it with *Tacca*, on account of the analogy in the number and direction of the stamens fixed on a 6-partite perianthium, and the parietal placentation of the seeds: but it is clear that this eminent botanist was not then aware of the structure of the ovarium in the section *Apterieæ*, which I have proposed in the last-mentioned natural order. In fine, I have no hesitation in referring both *Thismia* and *Ophiomeris* to *Burmanniaceæ*, notwithstanding that both these genera differ from all others of this order in the greater number of stamens, their reflected position, the annular corona, the circumscissure of the perianthium, and the opercular opening of the capsule; but the character of the order

\* This is rather indistinctly shown in vol. xix. pl. 39, illustrative of Mr. Griffith's memoir above-cited, where the separation of the filaments at their origin, and their subsequent junction into a tubular form, are not made evident; the former circumstance is however distinctly stated in the text, but the latter is too ambiguously worded in page 341 to enable a reader to comprehend the author's true meaning; it is difficult indeed to say which part really constitutes the filament, and which the connective, for the whole appears one homogeneous petaloid membrane.

will of course require some modification, in order to embrace them within its limits. The dehiscence of the pericarpium in the two genera under consideration, which, on a cursory glance, seems greatly at variance with the usual character of the order, will not, on closer examination, appear so very incongruous; for if we assume an instance where the capsule bursts after the manner of that of *Gonyanthes*\*, and imagine in such case the perianthium to be not only wingless, but destitute of the strong nerve upon which each wing is formed, the result would occur as in *Ophiomeris* and *Thismia*, the circumscissure of the tube and the opercular dehiscence of the fruit; and from the little we know of Blume's genus *Gymnosiphon*, we have reason to suppose its capsule bursts in a somewhat similar manner. In *Dictyostega*, the 3 strong ribs which proceed from the base of the ovarium, and remain attached to the wall of the cell, bearing in their middle the clustered placentations, continue their course along the disc, and again become united in the persistent style; in consequence of which the dehiscence takes place, as in *Burmannia*, by the disruption of the weaker membranous portions between the 3 persistent ribs. In *Cymbocarpa*, in consequence of the gibbous form of the ovarium, the dehiscence is caused by a single longitudinal laceration along its weaker side. In fact, in no instance, as far as I am aware, is there any approach to the ordinary valvular dehiscence in *Burmanniaceæ*; *Cymbocarpa* offers certainly the nearest approach to it, but in all cases the bursting of the cell is effected by a mere laceration of its reticulated membrane, varied in different cases by the absence or interruption of the placental ribs, or the intervention of dissepiments: in most instances this occurs rather in the sides of the capsule, on account of the greater tenuity of the membrane as it becomes dried; but in *Ophiomeris* and *Thismia* this takes place by the laceration (in an opercular form) of the disc, which is there more membranaceous than the comparatively fleshy wall of the unilocular cell†; while in *Dictyostega*, as before mentioned,

\* See Linn. Trans. vol. xviii. p. 537. TAB. XXXVIII. fig. 3, a.

† I may here observe, although I had an opportunity of examining only a single dried capsule of *Ophiomeris*, that notwithstanding the disc had fallen off, as shown in fig. 14, it appeared to me there came away with it, after being moistened, a detached and somewhat gelatinous 3-lobed process, which perhaps formed an extension of the placenta beneath the disc, which showed no indication whatever of any nervures on its surface; the style also that remained attached to the disc was now quite hollow and reduced to a thin fistular tube, leaving an uninterrupted channel through the open stigma

the dehiscence is effected by the rending of the thin membrane, both of the disc and the walls of the cell, in the manner shown in TAB. XXXVII. fig. 1, *i.* and fig. 2, *l.* of the eighteenth volume of the Society's 'Transactions.'

If, again, we imagine the stamens of *Apteria* with their curiously-expanded connective, retroflected at their origin, we should see a structure of these organs quite analogous to that existing in *Ophiomeris*. Such considerations, combined with other manifest characters, serve at once to clear the way for the admittance of these plants into *Burmanniaceæ*, in which natural order I propose to class *Ophiomeris* and *Thismia*, under a distinct section, to which the name of *Thismieæ* may be given. This family would hence be subdivided as follows :—

BURMANNIACEÆ.

- 1. BURMANNIÆ. Perianth. tripterum. Stam. 3. Ovar. 3-locul. Placent. centrales.
  - Capsula longit. dehiscens . . . . . 1. *Burmannia*.
  - Capsula transv. fenestrata . . . . . 2. *Gonyanthes*.
- 2. APTERIÆ. Perianth. exalatum. Stam. 3. Ovar. 1-locul. Placent. 3 parietales.
  - Capsula irreg. 3-valvis . . . . . 3. *Dictyostega*.
  - Capsula lateral. hians . . . . . 4. *Cymbocarpa*.
  - Capsula apice 3-valvis. Stamina appendiculata . . . . . 5. *Apteria*.
  - Capsula irreg. dchiscens. Petala nulla . . . . . 6. *Gymnosiphon*.
- 3. THISMIEÆ. Perianth. exalatum. Stam. 6. Ovar. 1-locul. Placent. 3 parietales.
  - Pericarpium circumscissum.
    - Tub. regul. Stam. monadelph. . . . . 7. *Thismia*.
    - Tub. gibbus. Stam. omninò libera . . . . . 8. *Ophiomeris*.

Having before alluded to the fact suggested by Mr. Griffith of the analogy which these two genera bear to *Tacca*, I will now, before making any observation on this head, first point out the remarkable resemblance in habit and

into the cavity of the cell; but whether the above-mentioned process formed the communicating medium of impregnation from the stigmata to the ovules, or whether it was foreign to its structure, I had no further means of ascertaining. I feel disposed however to prefer the former view, as it would seem to bear some analogy to the 2 glandular lobes that I formerly observed beneath the disc upon the termination of each of the 3 placentary ribs in the capsules of *Dictyostega*, *Cymbocarpa*, and *Apteria*, and which are represented in TAB. XXXVIII. fig. 4, *m*, illustrative of my memoir above-cited. If this should be the case, it would become a matter of some interest to ascertain what function these glandular masses perform in the process of fecundation, for it is natural to conclude, from their constant presence, that some definite office is assignable to them.

origin, as well as in the production of the lobes of the perianth into long setiform appendages, which are convolutely enclosed in æstivation, to that of the no less singular little plant *Triuris hyalina*, formerly described before the Society (Linn. Trans. xix. p. 78. tab. 7). It is also worthy of remark, that the genus *Peltophyllum* of Mr. Gardner (Linn. Trans. xix. p. 155. tab. 15), which is closely allied to *Triuris*, exhibits a radical leaf on a distinct lengthened petiole, offering another coincidental resemblance to *Tacca*, although the peltate form and peculiar venation of its leaf resembles more that of *Cissampelos*. It is true, that in *Tacca* there are 6 stamens fixed to the tube of a 6-partite perianthium, three of its lobes being smaller than the three other alternate ones; that the large fleshy connective which bears the anther is deflexed, so that it thus assumes an extrorse aspect; that the inferior ovarium is 1-celled, as in *Thismia*, and the ovules in like manner fixed on 3 parietal placentæ; that the seeds are borne upon a pendent funiculus, which, being retroverted, gives them an ascendant position, points in common in both cases: but their very distinct habit, the mode of their growth, the presence of large fully-developed leaves upon long radicular petioles, the mode of inflorescence, the existence of a distinct embryo enclosed in albumen, and other striking differences, prevent any association of these plants in the same natural order, the alliance of *Tacca* being evidently close to *Smilacææ*. *Triuris*, again, resembles *Ophiomeris* in the particulars just alluded to; but then its dioecious character, the union of its 3 pairs of anther-cells on a central fleshy connective in the one sex, and its numerous 1-seeded free ovaria in the other gender, remove it at once from *Burmanniaceæ*. If however we imagine a plant with 3 pairs of anthers similar to those of *Tacca*, their cucullate enlarged connectives being united into one central fleshy column, we have a structure not very dissimilar from the male flower of *Triuris*: indeed a somewhat similar structure is exhibited by *Ruscus* in *Smilacææ*. But although *Tacca* and *Triuris* offer several points of approach towards this last-mentioned family, the same cannot be said of any of the *Burmanniaceæ*, whose alliance is evidently close to the *Orchidææ*. It is however to be borne in mind, that in *Aristolochiææ* and *Menispermææ* we have instances of stamens united in a central column, and in the latter case also unisexual plants; but the apparent want of decided cotyledonous form in the embryo, the low degree of development in the whole plant, and the absence



of any approach to exogenous structure, places them at an immense distance in the natural system. Professor Lindley in his 'Vegetable Kingdom' arranges *Triuridaceæ* close to *Smilacæ*, no doubt for reasons similar to those before enumerated; so that through *Hydrocharideæ* they are thus allowed to approach *Burmanniaceæ*, and perhaps through *Fluviales*, the *Araceæ*; but until we have better evidence of the structure of these plants, it would be idle to speculate further on their nature.

Hammersmith, May 1846.

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### DESCRIPTION OF PLATE XV.

- Fig. 1. A plant of *Ophiomeris Macahensis*, Miers, of the natural size.  
 Fig. 2. An unopened bud :—magnified.  
 Fig. 3. An expanded flower, seen in front :—magnified.  
 Fig. 4. An expanded flower, seen laterally.  
 Fig. 5. An expanded flower, seen from the summit.  
 Fig. 6. An expanded flower, cut longitudinally.  
 Fig. 7. Filament, turned up to show the anther.  
 Fig. 8. Filament, with a portion of the perianthium, seen in profile.  
 Fig. 9. Filament, in its natural position, seen from within.  
 Fig. 10. Anther-lobes, in their natural direction.  
 Fig. 11. Style and stigma :—magnified.  
 Fig. 12. A fruit, with the perianthium fallen off :—of the natural size.  
 Fig. 13. A longitudinal section of the fruit, magnified, showing the placentæ.  
 Fig. 14. A longitudinal section of the fruit, magnified, after the falling off of the disc.  
 Fig. 15. A transverse section of ditto, showing the lines of placentation and the position of the seeds.  
 Fig. 16. Disc, style and stigma :—magnified.  
 Fig. 17. Seed, with its *funiculus* :—highly magnified.  
 Fig. 18. Seed, divested of half its testa, to show the included nucleus?  
 Fig. 19. Included nucleus?  
 Fig. 20. Section of a flower of *Thismia Brunonis*, Griff. (from a specimen in the herbarium of Sir W. J. Hooker) :—magnified.  
 Fig. 21. Section of a flower of ditto, with the monadelphous staminal tube turned up to show the anthers.

